

**Commonwealth of Kentucky**  
**Division for Air Quality**  
***PERMIT STATEMENT OF BASIS***

TITLE V (DRAFT PERMIT) No. V-05-089 R2

MARATHON PETROLEUM COMPANY, LLC

CATLETTSBURG REFINING, LLC

PO. Box 1492

CATLETTSBURG, KY

DATE: SEPTEMBER 24, 2008

SUKHENDU K MAJUMDAR, REVIEWER

**SOURCE I.D.** #21-019-00004

**SOURCE AI** # 339

**ACTIVITY I.D.**#APE20080006/20080007/20080008/20080010/  
20080011/20080015

**REVISION: V-05-089 R2:**

A significant revision application to increase the processing rate of Kerosene Desulfurization Unit (KDS) was received by the Division on May 5, 2008. The KDS unit started operation in March 2006 under the operating permit VF-04-001. The permit conditions were later subsumed into Title V permit V-05-089. The unit was originally permitted for a heater heat input capacity of 53.3 mmBtu/hr Higher Heating Value (HHV) and a nominal capacity of 25,000 barrel/day kerosene throughput. The facility has determined that the unit can be operated as built at 34,000 barrel/day and 65 mmBtu/hr HHV. Pursuant to 401 KAR 51:017 (16)(4) and 401 KAR 51:052 (7)(4), the change in processing rate would be a significant revision of the permit due to the change in existing heater duty and heater emission limits imposed in V-05-089 permit. Because the increase in heat input rate for the KDS unit will be achieved solely through the relaxation of the permit conditions with no physical change, the project was revaluated at the requested higher rates, as if construction had never commenced. From this analysis, the construction of the KDS Unit did not result in a net significant emissions increase pursuant to 401 KAR 51:017 or 401 KAR 51:052, based on the new heater input capacity and kerosene throughput.

Summary of KDS Unit Project Emissions Increase:

MPC UNIT #	Affected Area	Throughput	Emissions Changes (tons/year)					Comments
			SO2	NOx	VOC	CO	PM10	
2-122	KDS Unit Fugitives				21.60			No piping changes
2-122- B-1	KDS Charge Heater	65.0mmBtu/hr	7.56	14.2	1.6	23.9	2.2	Based on requested heat input limit
Tank 885	Kerosene Product Tank	34,000 barrels/day			0.66			VOC emissions from increased kerosene throughput
Tanks 886/887	KDS Feed Tanks	34,000 barrels/day			0.54			VOC emissions from increased kerosene throughput
na	Steam Demand	16.9 mmBtu/hr HHV	1.99	20.73	0.41	6.22	0.56	Increased utilization of existing steam boilers
<b>Total Project Increases</b>			<b>9.5</b>	<b>35.0</b>	<b>24.8</b>	<b>30.1</b>	<b>2.7</b>	
<b>Significant Level</b>			40.0	40.0	40.0	100.0	15.0	
Project Requires Netting?			no	no	no	no	no	

A significant revision application to modify and expand the Sulfolane Unit and construction of a barge loading vapor destruction unit (VDU) at the Light Oil Barge Loading Dock was received by the Division on August 19, 2008. Mobile Source Air Toxic (MSAT) Phase 2 rule triggered to modify and expand the Sulfolane Unit to produce 0.62 vol% benzene containing gasoline with averaging, banking and trading beginning January 1, 2011 for refiners. The Sulfolane Unit was designed with a nominal capacity of 25,000 barrels per day and will be expanded to 45,000 barrels per day based on reformat feed. Construction of the project will allow the Catlettsburg Refining, LLC to produce low-benzene containing gasoline as required by US EPA's MSAT Phase 2 final rule on February 9, 2007. At the petrochemical area of the refinery, benzene is used as a feedstock to produce cumene. During the periods of Cumene Unit outages, barge loading of unused benzene will be required to maintain optimum processing rates of the two reformers. These loading operations will be governed by 40 CFR 61 Subpart BB and required to have vapor controls. A vapor destruction unit (VDU) with an efficiency greater than 98% will be installed. The refinery is an existing source and is subject to the emission standards for existing sources in each of the emissions unit subcategories. The MSAT project will have little impact on the manner and extent to which 40 CFR 63 Subpart CC is applicable. The new MSAT related equipment will not have potential to emit 10 ton per year of any HAP or 25 tons per year combined HAPs. Therefore, under 40 CFR 63.640(i), the Sulfolane Unit is treated as a part of the existing affected source.

Applicability of the PSD regulations 401 KAR 51:017 is not triggered for the MSAT Sulfolane Unit expansion project because no significant net emissions increase will result. The emissions increase calculations include emissions from new and modified emissions units as well as other affected emissions units upstream and downstream of the new and modified equipment. The net emissions increases are shown in the Table below:

Pollutant	Baseline Actual Emissions (Avg. 2006 & 2007)	Potential to Emit (tpy)	Net Emissions Increase (tons/year)	Significant Threshold (tons/year)	PSD or NSR apply?
PM/PM-10	0.0	0.9	0.9	15	No
SO <sub>2</sub>	0.0	3.2	3.2	40	No
NO <sub>x</sub>	0.0	6.0	6.0	40	No
VOC	52.7	49.3	-3.4	40	No
CO	0.0	10.0	10.0	100	No

A minor permit revision application was received by the Division on June 16, 2008 for the corrections a few text inaccuracies and a few other corrections to the permit V-05-089 R1. These text inaccuracies and corrections are incorporated in the significant revision permit V-05-089 R2.

A minor permit revision application was received by the Division on July 7, 2008 for the revision of the synthetic minor limits to the Boiler Consolidation project. To ensure consistency with the consent decree entered into by CRLLC and the U.S. EPA, CRLLC requesting to revise the permit to include a cap on SO<sub>2</sub> emissions for the three new boilers. The revision to include SO<sub>2</sub> limits has been incorporated in the revised permit V-05-089 R2.

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Additional changes to permit V-05-089 R2 were made to include the minor permit revisions applications received by the Division after the first revision of the initial Title V permit. These changes are as follows:

- Final USA EPA consent decree for Heaters: Minor permit revision for the final consent decree agreement signed on February 7, 2008 between US EPA and the source to limit the emissions from FCC charge heater, Sat Gas heater and HPVGO charge heaters.
- Fuel Gas Drum on-line BTU Analyzer: Minor permit revision to install an on-line fuel gas BTU analyzer in one of the fuel gas drum. The on-line fuel gas analyzer would calculate High Heating Value (HHV) of the fuel gas. The HHV would be used to determine the firing duty of the heaters.

#### Section D – Source Emission Limitation and Testing Requirements:

Under paragraphs 3 and 4, Ambient Air Monitoring (AAM) was specified on page of 339 of permit V-05-089, which go back to requirements from operating permit O-93-016. A February 27, 2007 review of the USEPA air data website documents that no exceedances (flagged data) of the National Ambient Air Quality Standards (NAAQS) have been recorded during the period from 1983 through 2005 (the latest complete data available on the site) for the criteria pollutants monitored. CRLLC has requested that the West Virginia air monitoring sites be removed from the Title V permit. CRLLC's first removal request was submitted on August 18, 2005 to Mr. John Lyons, Director of the Division for Air Quality (Division). NAAQS compliance has been sustained over the last twenty three years at the 3 monitoring sites.

The Division needs to continue air monitoring or have air monitoring performed in the region to show continuing compliance with the NAAQS. The Division cannot put an air monitoring station in West Virginia, even though air quality attainment issues in Boyd county, Kentucky, may be due to emissions in West Virginia. West Virginia has not put up air monitors in that area, and Kentucky cannot make them install and operate monitors. The Division will contact EPA Region 4 to discuss monitoring sites in Kentucky, but due to the terrain and geography in Boyd county, Kentucky, this is a difficult undertaking. The monitoring sites in West Virginia will remain in the permit until another method of meeting EPA requirements is met.

#### **SOURCE DESCRIPTION:**

Marathon Petroleum Company at the Catlettsburg Refining, LLC (CRLLC) processes petroleum crude oil to produce gasoline, diesel fuel, kerosene, and jet fuel and petroleum derivatives such as petrochemicals and lube oil feed stock. Besides the crude oil processing units, the refinery has boilers, sulfur plants, and waste water treatment. Raw crude, refined petroleum products and intermediates are stored in the storage tanks for distribution and further processing.

The refinery at Catlettsburg uses the Big Sandy River to transport domestic crude oil and product distribution in barges. Besides the river transportation, there are railroad tank cars, truck loading,

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and unloading facilities at different areas of the refinery used for efficient movement of transportation fuels, lube oil feed stock and petrochemicals. Viney Branch transfer racks are provided with a Vapor Recovery Unit (VRU) to absorb volatile organic compounds (VOC) in the activated carbon during loading operation. Activated carbon is regenerated by vacuum by using vacuum pump and the vapor is condensed to recover the hydrocarbon liquid. The vapor recovery system has an absorption and regeneration cycle. VOCs are controlled during solvent loading in the trucks and rail cars by use of the Vapor Destruction Unit (VDU) to reduce the air emissions.

The light gases produced during the processing of the crude oil are used by the refinery sweet fuel gas system after being treated with amines. The refinery fuel gas is used for process heaters, steam generating boilers, flares and incinerators.

Amines are regenerated for recycling. Amine regenerator off-gas along with foul water stripper off-gas from the wastewater treatment area, are directed to the sulfur plant. The sulfur plant produces metallic sulfur in the Claus reactors and reduces the sulfur dioxide (SO<sub>2</sub>) emission from refinery. Some of the heaters and boilers at the refinery are provided with low nitrogen oxide (NO<sub>2</sub>) burners to reduce NO<sub>x</sub> emissions to the ambient air.

The refinery has one Fluidized Catalytic Cracking (FCC) unit, two Catalytic Cracking Reformer (CCR) units, and one HF Alkylation unit to produce and improve the Research (RON) and Motor (MON) octane, for the three grades of gasoline distributed in the pumps.

The CRLLC has a Lube Oil Complex to produce Lube Feed stock. Lube crude is processed in the #5 crude unit, and the lube vacuum unit makes the 100N and 325N waxy distillate. Waxy distillates are further treated in the Furfural Extraction unit and MEK De-waxing units to produce salable lube feed stock.

The CRLLC also manufactures petrochemicals such as cumene, solvents and other products to be further processed in the chemical industry. Some of the aromatics are also produced in the petrochemical area such as benzene, toluene, xylene, and naphthalene. The refinery brings in Coal Tar Light Oil (CTLO) from the coal industry to meet the demand of benzene in the manufacture of cumene. Light liquid from the reformers and distilled liquids from the CTLO are separated in the Sulfolane Unit liquid-liquid extraction process to produce benzene, toluene and xylene.

The refinery has two independent waste water systems: Oily water sewer system and NESHAP regulated waste water system. The NESHAP water is being collected in collection pits through out the refinery process units and pumped to a storage tank. Water from the storage tank, before going to the common treatment facility, is being treated in the Benzene Recovery Unit (BRU).

#### INITIAL TITLE V PERMIT DIVISIONS:

In the Title V initial operating permit, the refinery was broken down into nine areas based on the similarity of the process and state air regulations:

1. Transfer Racks: Loading/unloading raw materials and products;
2. Flares;
3. Cooling Towers;

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4. Heaters, Boilers and Combustion Devices;
5. Process Units;
6. Storage Vessels;
7. General Wastewater Treatment Area
8. Benzene Wastewater Treatment Area
9. Remediation

**TRANSFER RACKS:****APPLICABLE REGULATIONS:**

401 KAR 60:005 incorporating by reference 40 CFR 60 Subpart J	Standards of Performance for Petroleum Refineries
401 KAR 60:005 incorporating by reference 40 CFR 60 Subpart XX	Standards of Performance for Bulk Gasoline Terminals
401 KAR 57:002 incorporating by reference 40 CFR 61 Subpart A	General Provisions
401 KAR 57:002 incorporating by reference 40 CFR 61 Subpart BB	Benzene Emissions from Benzene Transfer Operations
401 KAR 63:002 incorporating by reference 40 CFR 63 Subpart G	National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemicals Manufacturing Industry for Process Vents, Storage Vessels, Transfer Operations, and Wastewater
401 KAR 63:002 incorporating by reference 40 CFR 63 Subpart R	National Emission Standards for Gasoline Distribution Facilities (Bulk Gasoline Terminals and Pipeline Breakout Stations)
401 KAR 63:002 incorporating by reference 40 CFR 63 Subpart Y	National Emission Standards for Marine Tank Vessel Loading Operations
401 KAR 63:002 incorporating by reference 40 CFR 63 Subpart CC	National Emission Standards for Hazardous Air Pollutants from Petroleum Refineries

**NON-APPLICABLE REGULATIONS:**

401 KAR 59:101	New Bulk Gasoline Plants
	Per Section 1(2), rule does not apply since tank trucks, trailers, railroad cars, or other mobile non-marine vessels are not used for incoming gasoline transfer operations
401 KAR 61:056	Existing Bulk Gasoline Plants
	Per Section 1(2), rule does not apply since tank trucks, trailers, or other mobile non-marine vessels are not used for incoming gasoline transfer operations
401 KAR 51:017	Prevention of Significant Deterioration of Air Quality (PSD)
	The permittee has elected to accept permit conditions for the Viney Branch Truck Rack (EP- L005) in order to preclude the applicability of PSD to the construction authorized by permit S-96-251
	The permittee has elected to accept permit conditions for the New Solvent Truck Rack (EP- L004) in order to preclude the applicability of PSD to the construction authorized by permit C-88-209

**REGULATORY CLARIFICATIONS:**

40 CFR 60 Subpart XX, Standards of Performance for Bulk Gasoline Terminals

**L005    1-7-J-02    Viney branch truck loading / unloading rack**

The above loading rack is subject to the requirements of 40 CFR 60 Subpart XX. However, pursuant to 40 CFR 63 Subpart CC Section 63.650(a), the transfer rack must comply with the referenced requirements of 40 CFR 63 Subpart R.

40 CFR 63 Subpart R Section 63.420(g) states that: “*each owner or operator of a bulk gasoline terminal or pipeline breakout station subject to the provisions of this subpart that is also subject to the provisions of 40 CFR part 60, subpart Kb or XX of this chapter shall comply only with the provisions in each subpart that contain the most stringent control requirements for that facility.*” The referenced requirements of 40 CFR 63 Subpart R are more stringent than the requirements of 40 CFR 60 Subpart XX. Therefore, compliance with 40 CFR 63 Subpart R is accepted as demonstrating compliance with 40 CFR 60 Subpart XX.

40 CFR 63 Subpart G, HON Transfer Racks

<b>L004</b>	<b>1-7-J-01</b>	<b>New solvent truck loading rack</b>
<b>L006</b>	<b>1-7-J-03</b>	<b>Solvent (A&amp;A) railcar loading / unloading rack</b>
<b>L007</b>	<b>1-7-J-04</b>	<b>Old solvent truck loading rack</b>

The above transfer racks are associated with HON chemical manufacturing process units. Based on the definitions in 40 CFR 63.111, these transfer racks are Group 2 transfer racks because the rack weighted annual average vapor pressure of liquid products containing organic hazardous air pollutants for each rack is less than 10.3 kilopascals. Therefore, pursuant to 40 CFR 63.126(c), these transfer racks are subject only to the record keeping provisions of 40 CFR 63.130(f), and no other provisions of 40 CFR 63 Subpart G apply.

40 CFR 63 Subpart Y, Marine Tank Vessel Loading Operations

<b>L001</b>	<b>1-6-J-01</b>	<b>Heavy oil barge loading / unloading dock</b>
<b>L008</b>	<b>1-7-J-05</b>	<b>Light oil barge loading / unloading dock</b>
<b>L015</b>	<b>2-5-J-02</b>	<b>Crude oil barge loading / unloading dock</b>

Pursuant to 40 CFR 63 Subpart CC Section 63.651(a), the above marine tank vessel loading operations located at the refinery shall comply with the requirements of Sections 63.560 through 63.567 of 40 CFR 63 Subpart Y. In order to preclude the applicability of Sections 63.562(b), (c), and (d), the permittee has accepted annual loading and emission limits for the above loading operations. Pursuant to 40 CFR 63 Subpart Y Section 63.560(a)(2) and (b)(2), the emission standards contained in Sections 63.562(b), (c), and (d) do not apply to the marine tank loading operations listed above because:

- (a) Marine tank loading operation emissions of each individual HAP are less than 10 tons per year and emissions of all HAP combined are less than 25 tons per year, as determined by the emission estimation method specified in 40 CFR 63.565(l); and
- (b) Less than 10 million barrels/year of gasoline and less than 200 million barrels/year of crude oil is loaded at marine tank loading operations.

40 CFR 61 Subpart BB, Benzene Transfer Operations: Unused benzene will be loaded on a barge during the periods of cumene unit outages for the emission unit L008 (1-7-J-05) light oil barge loading/unloading dock. A vapor destruction unit (VDU) will be utilized for control of emissions. Requirements in 40 CFR 61 Subpart BB for flares, tank trucks and railcars are not applicable. Requirements for an incinerator (not a catalytic incinerator) are applicable.

**SIGNIFICANT REVISION TO REVISE THE VINEY BRANCH TRUCK LOADING RACK LIMITS**

An application to revise the exiting limits on throughput of Emission Unit L005 (1-1-J-02), the Viney Branch Truck Loading Rack was received on August 10, 2006. The proposed change does

not involve any physical changes. The existing throughput limits on the Viney Branch Truck Loading Rack appears to be a synthetic minor limit that was put in place in 1996, in permit S-96-251, when five new loading arms were added to the Viney Branch Truck Loading Rack. The permittee has elected to accept permit limits of 120.9 tons per year of VOC instead of operating limits from the Viney Branch Truck Rack, in order to preclude the applicability of PSD to the construction authorized by permit S-96-251.

### **REFINERY FLARES:**

#### **APPLICABLE REGULATIONS:**

401 KAR 60:005 incorporating by reference 40 CFR 60 Subpart A, Section 60.18	General Control Device Requirements: Applicable by reference from 40 CFR 60.482-10(d)
401 KAR 60:005 incorporating by reference 40 CFR 60 Subpart J	Standards of Performance for Petroleum Refineries
401 KAR 63:002 incorporating by reference 40 CFR 63 Subpart A, Section 63.11	Control Device Requirements: Applicable by reference from 40 CFR 63.643(a)(1), 63.113(a)(1)(i), and 63.116(a)
401 KAR 63:002 incorporating by reference 40 CFR 63 Subpart CC	National Emission Standards for Hazardous Air Pollutants from Petroleum Refineries
401 KAR 63:015	Flares

#### **REGULATORY CLARIFICATIONS**

- A. Compliance with 40 CFR 63 Subpart CC and 40 CFR 63.11 is deemed as demonstrating compliance with 401 KAR 63:015 and 40 CFR 60.18.

The Division shall consider occurrences involving both process equipment and flares individually and collectively for the purpose of evaluating malfunction, start-up and shutdown criteria found in 401 KAR 50:055, upon submittal by the permittee of all necessary information to make a complete review of such incidents.

- B. Compliance with the standards and requirements of 40 CFR 60.482-10, as referenced by 40 CFR 63.648(a), and 40 CFR 63.644, 63.645, and 63.654, for the closed-vent and flare system is accepted as demonstrating compliance with the standards and requirements in 40 CFR 63.114, 63.118, 63.152, 63.172, and 63.181(g).



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- C. Several process vents within the refinery are routed to flares (and heaters and boilers) for control of air emissions without meeting the monitoring requirements specified to demonstrate compliance with 40 CFR 60.104(a)(1), no flare shall burn any fuel gas that contains hydrogen sulfide (H<sub>2</sub>S) in excess of 230 mg/dscm (0.10 gr/dscf), based on a 3-hour rolling average. As allowed by 40 CFR 60.13(i), these streams are monitored according to requested alternative monitoring plans (AMPs).
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## **REFINERY COOLING TOWERS:**

### **APPLICABLE REGULATIONS:**

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401 KAR 63:002 incorporating by reference 40 CFR 63 Subpart F	National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemicals Manufacturing Industry
	Petrochem Cooling Towers #1 and 2 are only 2 coolers used for synthetic organic chemical manufacturing.

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### **NON-APPLICABLE REGULATIONS:**

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40 CFR 63 Subpart Q - National Emission Standards for Hazardous Air Pollutants from Industrial Process Cooling Towers	Pursuant to 40 CFR 63.400(a), the provisions of 40 CFR 63 Subpart Q do not apply to cooling towers at the refinery because no cooling towers were operated with chromium-based water treatment chemicals on or after September 8, 1994
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The source has elected to accept permit conditions to preclude the applicability of 401 KAR 51:017, Prevention of Significant Deterioration.

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## **REFINERY HEATERS, BOILERS, COMBUSTION DEVICES:**

### **APPLICABLE REGULATIONS:**

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401 KAR 59:015	New Indirect Heat Exchangers
401 KAR 60:005 incorporating by reference 40 CFR 60 Subpart A	General Provisions

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401 KAR 60:005 incorporating by reference 40 CFR 60 Subpart Db	Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units
401 KAR 60:005 incorporating by reference 40 CFR 60 Subpart Dc	Standards of Performance for Small Industrial-Commercial- Institutional Steam Generating Units
401 KAR 60:005 incorporating by reference 40 CFR 60 Subpart J	Standards of Performance for Petroleum Refineries
401 KAR 61:015	Existing Indirect Heat Exchangers
401 KAR 61:145	Existing Petroleum Refineries
401 KAR 63:002 incorporating by reference 40 CFR 63 Subpart DDDDD	National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boiler and Process Heaters
401 KAR 51:160	NOx Requirement for Large Utility & Industrial Boilers.
401 KAR 51:190	Banking & Trading NOx Allowances.
401 KAR 51:220	CAIR NOx Ozone Season Trading Program.

**NON-APPLICABLE REGULATIONS:**

40 CFR 60 Subpart Dc	Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units Rule does not apply to the following units: <b>East Portable Boiler (#1)</b> <b>West Portable Boiler (#2)</b> <b>Portable Boiler #3 (Lube North)</b> <b>Portable Boiler #4 (Lube South)</b> Rule does not apply to mobile sources.
40 CFR 60 Subpart J	Standards of Performance for Petroleum Refineries  Rule does not apply to the <b>Lube Plant Asphalt Oxidizer Fume Burner (1-006-B-006)</b> . Emissions from the blowing still combusted in the oxidizer are not considered a fuel gas. [EPA Non-Applicability Clarification issued May 11, 2005]
40 CFR 63 Subpart DDDDD	National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boiler and Process Heaters.

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**NON-APPLICABLE REGULATIONS:**

	Existing small gaseous fuel boilers as identified in permit V-05-089 are not subject to any requirements in 40 CFR 63 Subparts A or DDDDD [63.7506(c)(3)]
40 CFR 63 Subpart DDDDD	<p>National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boiler and Process Heaters.</p> <p>Existing large gaseous fuel boilers as identified in permit V-05-089 are subject to the initial notification requirements in 40 CFR 63 Subparts A Section 63.9(b). They are not subject to any other requirements of 40 CFR 63 Subpart A or DDDDD. [63.7506(b)(1)].</p>
401 KAR 51:017 and	Prevention of Significant Deterioration of Air Quality, and
401 KAR 51:052	<p>Review of New Sources In or Impacting Upon Non-Attainment Areas</p> <p>The permittee has elected to accept permit conditions to preclude the applicability of 401 KAR 51:017 and 401 KAR 51:052. These conditions are identified within the permit.</p>
401 KAR 59:015 Section 6(1)(a), NOx Emission Limitation	<p>NOx emissions from the <b>FCCU North and South Heat Recovery Units (2-116-B-001 and 002)</b> are not subject to 401 KAR 59:015 Section 6 because the heat input capacity derived from the combustion of fuel (as defined in 401 KAR 59:001) is less than 250 mmBtu/hr. Heat input to these sources is derived from a combination of fuel (refinery fuel gas and natural gas) and FCCU process off-gases. The amount of heat input provided by the FCCU process off-gases is not classified as fuel heat input, and therefore does not apply towards the 250 mmBtu/hr heat input criteria. For each of these sources, the amount of heat input provided by fuel is less than 250 mmBtu/hr.</p>

40 CFR 51 Subpart G

Under the provisions of 40 CFR 51 Subpart G the **FCCU North and South Heat Recovery Units (2-116-B-001 and 002)** are not classified as fossil fuel-fired NO<sub>x</sub> sources with a maximum design heat input greater than 250 mmBtu/hr. Heat input to these sources is derived from a combination of fossil fuels (refinery fuel gas and natural gas) and FCCU process off-gases. The amount of heat input provided by the FCCU process off-gases is not classified as fossil fuel heat input, and therefore does not apply towards the 250 mmBtu/hr heat input criteria. For each of these sources, the amount of heat input provided by fossil fuels is less than 250 mmBtu/hr.

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401 KAR 60:005 incorporating by  
reference 40 CFR 60 Subpart D

Standards of Performance for Fossil Fuel Fired Steam  
Generators for which Construction is Commenced after  
August 17, 1971

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**REGULATORY CLARIFICATIONS:**

401 KAR 59:015 Section 3(a) and Section 5 Sulfur Dioxide Standards

Sulfur dioxide emission limitations apply to the indirect heat exchangers, as indicated in permit V-05-089. However, the sulfur dioxide standard of 40 CFR 60 Subpart J Section 60.104(a)(1) (maximum 0.10 gr/dscf in fuel gas burned) is more stringent. Therefore, compliance with 60.104(a)(1) is accepted as demonstrating compliance with the 401 KAR 59:015 Sulfur dioxide emission limits.

401 KAR 61:145 Section 3(1) Sulfur Dioxide Standards:

Sulfur dioxide standard applies to the indirect heat exchangers as indicated in permit V-05-089. However, the sulfur dioxide standard of 40 CFR 60 Subpart J Section 60.104(a)(1) (maximum 0.10 gr/dscf in fuel gas burned) is equivalent. Therefore, compliance with 60.104(a)(1) is accepted as demonstrating compliance with the 401 KAR 61:145 sulfur dioxide standard.

## **SIGNIFICANT REVISION TO CHANGE SYNTHETIC MINOR REVISION LIMIT**

An application for a 4<sup>th</sup> revision to the Refinery Modernization Project Permit (VF-02-001, R3) was received on April 14, 2006. The revision proposed to decrease the synthetic minor emission limits of emission unit H020 (2-23-B-6), No. 4 Vacuum Charge Heater, and increase the synthetic minor emission limits of emission unit H001 (1-2-B-3), No. 2 Crude Charge Heater. Overall, allowable emissions decreased with the requested change.

The nominal rated heat input capacity of H001 (1-2-B-3) was under-rated in the previous permit. The nominal rated heat input capacity was increased from 109 mmBtu/hr to 113.6 mmBtu/hr (LHV basis) for H001 (1-2-B-3), No. 2 Crude Charge Heater. Heater H001 was confused with another heater. Operationally, H020 (2-23-B-6) cannot operate at the rating in the previous permit. The nominal rated heat input capacity was decreased from 182 mmBtu/hr to 145.0 mmBtu/hr (LHV basis) for H020 (2-23-B-6), No. 4 Vacuum Charge Heater.

The synthetic minor emission limits for H001 (1-2-B-3), No. 2 Crude Charge Heater and H020 (2-23-B-6), No. 4 Vacuum Charge Heater were changed as follows:

	<b>Maximum Emissions (tons/yr)</b>				
	<b>New limit</b>				
	<b>(existing limit)</b>				
	<b>SO<sub>2</sub></b>	<b>NO<sub>x</sub></b>	<b>VOC</b>	<b>CO</b>	<b>PM<sub>10</sub></b>
H001 (1-002-B-003) No. 2 Crude Charge Heater	14.7 (12.8)	54.8 (47.1)	3.0 (2.6)	46.0 (40.1)	4.2 (3.6)
H020 (2-023-B-006) No. 4 Vacuum Charge Heater	18.8 (21.4)	97.8 (111.3)	3.8 (4.4)	58.7 (66.8)	5.3 (6.0)

## **SIGNIFICANT REVISION TO INSTALL 3 NEW BOILERS/BOILER CONSOLIDATION PROJECT**

An application for the installation of three (3) new package boilers (2-601-B-13, 2-601-B-14, 2-601-B-15) was received on May 15, 2006. As part of the project, seven (7) existing in-service boilers (2-601-B-5, 2-601-B-6, 1-9-B-7, 1-9-B-8, 2-601-B-10, 1-39-B-11, 2-601-B-12) will be removed. Each new boiler will have a maximum heat input capacity of 249.9 mmBtu/hr. As shown below in the following table, the emissions increase from the proposed 3 new package boilers will be above the Prevention of Significant Deterioration of Air Quality (PSD) significance level for NO<sub>x</sub>, CO, and PM<sub>10</sub>, but not for VOC or SO<sub>2</sub>. To ensure consistency with consent decree entered into by CRLLC and the US. EPA on February 7, 2008, CRLLC requested in an application dated July 7, 2008 to include a cap on SO<sub>2</sub> emissions for the three new boilers. The requested emission cap of 30.3 tons per year, based on a daily rolling 365-day sum, will ensure that the Boiler Consolidation Project does not result in a significant emission increase.

Emission Unit	Maximum Firing Rate (mmBtu/hr)	Emission Changes (tons/yr)					Comments
		SO <sub>2</sub>	NO <sub>x</sub>	VOC	CO	PM <sub>10</sub>	
B024 (2-601-B-13)	249.9	10.1	38.3	5.9	43.8	8.2	Potential to emit of new boilers are based on one-third of proposed emission cap for NO <sub>x</sub> and CO; based on heat input capacity and NSPS allowable fuel sulfur for SO <sub>2</sub> ; and based on heat input capacity and AP-42 emission factors for other pollutants.
B025 (2-601-B-14)	249.9	10.1	38.3	5.9	43.8	8.2	
B026 (2-601-B-15)	249.9	10.1	38.3	5.9	43.8	8.2	
Total Project Increases		30.3	114.9	17.7	131.4	24.6	
Significant Level		40	40	40	100	15	
Requires Netting		no	yes	no	yes	yes	

A netting analysis was performed for NO<sub>x</sub>, CO, and PM<sub>10</sub>, based on the project decreases from the 7 boilers listed in the following table.

Emission Unit	Maximum Firing Rate (mmBtu/hr)	Emission Changes (tons/yr)				Comments
		SO <sub>2</sub>	NO <sub>x</sub>	CO	PM <sub>10</sub>	
B005 (2-601-B-5)	29.1	1.1	12.7	4.2	0.9	Actual emissions of SO <sub>2</sub> for the period 1/1/2004 through 12/31/2005, and others for the period 10/1/2000 through 9/30/2002. NO <sub>x</sub> emissions based on 0.10 lb/mmBtu emission factor, based on AP-42 table 1.4-2, 1998 edition. CO emissions based on 0.083 lb/mmBtu emission factor for industrial boilers in AP-42 Table 1.4-1, 1998 edition. PM10 emissions based on 0.0075 lb/mmBtu emission factor, based on AP-42 table 1.4-2, 1998 edition.
B015 (2-601-B-6)	36.9	0.9	16.2	13.3	1.2	
B011 (1-9-B-7)	30.2	1.6	11.9	10.9	1.0	
B012 (1-9-B-8)	23.8	2.1	9.4	8.6	0.8	
B016 (2-601-B-10)	56.5	2.1	39.6	20.4	1.8	
B023 (1-39-B-11)	52.3	1.6	38.9	18.8	1.7	
B017 (2-601-B-12)	104.6	3.2	40.9	37.7	3.4	
Total Project Decreases		12.6	169.6	113.9	10.8	

The net change in emissions from the boiler consolidation project is as follows:

Net change in emissions from the proposed Boiler consolidation project	Emission Changes (tons/yr)			
	SO <sub>2</sub>	NO <sub>x</sub>	CO	PM <sub>10</sub>
	17.7	-54.7	17.5	13.8

### **REFINERY PROCESS UNITS:**

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**APPLICABLE REGULATIONS**

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401 KAR 59:046	Selected New Petroleum Refining Processes and Equipment
401 KAR 61:135	Selected Existing Petroleum Refining Processes and Equipment
401 KAR 61:137	Leaks from Existing Petroleum Refinery Equipment. Boyd county is currently Subpart I non-attainment for the ozone 8-hr standard. The rule applies to at least one component in almost every process unit, but compliance with 401 KAR 61:037 is demonstrated by compliance with 40 CFR 63, subpart H or 40 CFR 63 subpart CC. If equipment is not subject to either 40 CFR 63 Subpart H or 40 CFR 63 Subpart CC, units were voluntary included in either 40 CFR Subpart H or Subpart CC monitoring program by the facility.
401 KAR 63:010	Fugitive Emissions.
401 KAR 60:005 incorporating by reference 40 CFR 60 Subpart A	General Provisions.
401 KAR 60:005 incorporating by reference 40 CFR 60 Subpart GGG	Standards of Performance for Equipment Leaks of VOC in Petroleum Refineries.
401 KAR 60:005 incorporating by reference 40 CFR 60 Subpart J	Standards of Performance for Petroleum Refineries.
401 KAR 60:005 incorporating by reference 40 CFR 60 Subpart VV	Standards of Performance for Equipment Leaks of VOC in the Synthetic Chemicals Manufacturing Industry.
401 KAR 57:002 incorporating by reference 40 CFR 61 Subpart J	National Emission Standards for Equipment Leaks (Fugitive Emission Sources) of Benzene.
401 KAR 63:002 incorporating by reference 40 CFR 63 Subpart CC	National Emission Standards for Hazardous Air Pollutants from Petroleum Refineries.
40 CFR 63 Subpart UUU	National Emission Standards for Hazardous Air Pollutants for Petroleum Refineries.
401 KAR 63:002 incorporating by reference 40 CFR 63 Subpart G	National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemicals Manufacturing Industry for Process Vents, Storage Vessels,

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**APPLICABLE REGULATIONS**

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	Transfer Operations, and Wastewater.
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**NON-APPLICABLE REGULATIONS:**

401 KAR 59:015, New Process Gas Streams	The provisions of 401 KAR 59:015 do not apply to the Lube Plant Asphalt Oxidizer (1-105) and associated Fume Burner.
401 KAR 60:005 incorporating by reference 40 CFR 60 Subpart UU, Standards of Performance for Asphalt Processing.	The provisions of 40 CFR 60 Subpart UU do not apply to the Lube Plant Asphalt Oxidizer (1-105) since it was constructed prior to November 18, 1980 and has not been reconstructed or modified.
401 KAR 61:035, Existing Process Gas Streams	Although there are streams that commenced before June 6, 1979 and the facility is located in a Class VA county for sulfur dioxide, all hydrogen sulfide and sulfur dioxide vent emissions from refinery process units are subject to other standards of performance for either hydrogen sulfide or sulfur dioxide. Therefore, 401 KAR 61:035, Section 3 and 4, are not applicable for hydrogen sulfide and sulfur dioxide limits. Boyd county is an attainment area for carbon monoxide, therefore, 401 KAR 61:035, Section 5, is not applicable for carbon monoxide limits.

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**REGULATORY CLARIFICATION AND DETERMINATION:**

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- A. For purposes of 40 CFR 63 Subpart G and CC, a list shall be maintained of all affected process vents, as defined in 40 CFR 63.111 and 40 CFR 63.641, and their associated control devices. Certain relief valves are not process vents because (1) their operation is critical to the safe operation of the process units and (2) their emissions occur only intermittently. The process vents are exempt from any of the emission standards of 40 CFR 63 Subpart G and CC because they are vented to one of the control options of these subparts. Further, the emissions from process vents are not considered fuel gas and therefore are not subject to the provisions of 40 CFR 60 Subpart J. The control devices shall be maintained and operated in accordance with the provisions of 40 CFR 63 Subpart G and CC as detailed in the conditions of this permit. Upset and blanket gases are routed to the flare system, which is compliant with the 40 CFR 63 Subpart CC provisions.
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- B. 40 CFR 63 Subpart CC provides two LDAR compliance options for affected process units: 40 CFR 60 Subpart VV and 40 CFR 63 Subpart H. Permit V-05-089 specifies which LDAR compliance option has been chosen for each process unit subject to 40 CFR 63 Subpart CC.
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- C. Except as noted in Permit V-05-089, compliance with the standards and requirements for equipment leaks of VOC in either 40 CFR 63 Subpart H or 40 CFR 63 Subpart CC is deemed as demonstrating compliance with the standards and requirements in 40 CFR 60 Subpart VV, 40 CFR 60 Subpart GGG, and 401 KAR 61:137. Equipment not subject to either 40 CFR 63 Subpart H or 40 CFR 63 Subpart CC will be evaluated on a case-by-case basis for voluntary inclusion in either the Subpart H or Subpart CC monitoring program. Pursuant to the conditions below, records will be maintained of the equipment included in each of the different monitoring programs.
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- D. As specified in 40 CFR 63.640(p), equipment leaks that are also subject to the provisions of 40 CFR parts 60 and 61 are required to comply only with the provisions specified in 40 CFR 63 Subpart CC.
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- E. As specified in 40 CFR 63.640(g)(7), process units and emission points subject to 40 CFR 63 Subparts F, G, and H are not subject to 40 CFR 63 Subpart CC.
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- F. As specified in 40 CFR 63.160(b), equipment leaks that are also subject to the provisions of 40 CFR parts 60 and 61 (including 40 CFR 60 Subpart VV and 40 CFR 61 Subparts J and V) are required to comply only with the provisions specified in 40 CFR 63 Subpart H.
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- G. Compliance with the standards and requirements of 40 CFR 60.482-10, as referenced by 40 CFR 63.648(a), and 40 CFR 63.644, 63.645, and 63.654, for the closed-vent and flare system is accepted as demonstrating compliance with the standards and requirements in 40 CFR 63.114, 63.118, 63.152, 63.172, and 63.181(g).
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- H. All petroleum refinery valves in process units listed in Permit V-05-089 as subject to the 40 CFR Part 60 Subpart VV compliance option for 40 CFR 63 Subpart CC (as referenced by 40 CFR 63.648(a)), and which are determined to be in VOC service, are presumed to be in organic hazardous air pollutant (OHAP) service and therefore subject to 40 CFR Part 60 Subpart VV (40 CFR 63.648(a)(1)). For pumps, compressors, and sample stations the permittee shall individually determine or designate which are in OHAP service. Those pumps, compressors and sample stations not in OHAP service and for which construction or modification was commenced before January 4, 1983 (40 CFR 60.590(b)) shall be subject to 401 KAR 61:137. For purposes of 40 CFR 63.648(a)(2), calculation of leaking components is performed on a process unit basis. Pursuant to 40 CFR 60.482-1(d), for equipment not in organic HAP service, as defined in 40 CFR 63.161, equipment that is in vacuum service is excluded from the requirements of 40 CFR 60.482-2 to 60.482-10 if it is identified as required in 40 CFR 60.486(e).
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- I. No compressors are in HON services. No surge control vessels or bottoms receivers associated with a process unit listed as subject to 40 CFR 63 Subpart H in Permit V-05-089 are subjected to the provisions of 40 CFR 63.170. Surge control vessels and bottoms receivers are routed back to the process unit. Upset and blanket gases are routed to the flare system, which is compliant with the 40 CFR 63 Subpart CC provisions.
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- J. Pursuant to 40 CFR 63.112(e)(2), the owner or operator is not required to calculate the annual emission rate specified in 40 CFR 63.112(a).
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- K. Pursuant to 40 CFR 63.642(k)(2), the owner or operator is not required to calculate the annual emission rate specified in 40 CFR 63.642(g).
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- L. Pursuant to 40 CFR 63.148(k), the closed-vent system is not subject to the provisions of 40 CFR 63.148 because it is subject to the provisions of 40 CFR 63.172.
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- M. Pursuant to 40 CFR 60.486(k), the provisions of 40 CFR 60.7(b) and (d) do not apply to affected facilities subject to 40 CFR 60 Subpart VV.
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- N. Pursuant to 40 CFR 63.162(d), for process units listed as subject to 40 CFR 63 Subpart H in Permit V-05-089, equipment that is in vacuum service is excluded from the requirements of 40 CFR 63 Subpart H.
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- O. Pursuant to 40 CFR 63.162(e), for process units listed as subject to 40 CFR 63 Subpart H in Permit V-05-089, any pump, compressor, agitator, pressure relief device, sampling connection system, open-ended valve or line, valve, connector, surge control vessel, bottoms receiver, instrumentation system, control device or system that is intended to operate in organic hazardous air pollutant service, as defined in 40 CFR 63.161, for less than 300 hours during the calendar year is exempt from the provisions of 40 CFR Part 63.163 through 63.174 and 63.178, if it is identified as required in 40 CFR 63.181(j).
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- P. Pursuant to 40 CFR 63.640(d)(3), for process units listed as subject to 40 CFR 63 Subpart CC for refinery leaks in Permit V-05-089, any pump, compressor, pressure relief device, sampling connection system, open-ended valve or line, valve, or instrumentation system that is intended to operate in organic hazardous air pollutant service, as defined in 40 CFR 63.641, for less than 300 hours during the calendar year is exempt from the provisions of 40 CFR Part 63.648.
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- Q. Pursuant to 40 CFR 63.648(f), for process units subject to 40 CFR 63 Subpart CC for refinery leaks in Permit V-05-089, reciprocating pumps in light liquid service are exempt from 40 CFR 60.482 if recasting the distance piece or reciprocating pump replacement is required.
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- R. Pursuant to 40 CFR 63.648(g), for process units subject to 40 CFR 63 Subpart CC for refinery leaks as listed in Permit V-05-089, compressors in hydrogen service are exempt from the requirements of 40 CFR 63.648(a) and (c) if the owner or operator demonstrates that the compressors are in hydrogen service according to the methods specified in 40 CFR 63.648(g).
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- S. Pursuant to 40 CFR 63.648(i), for process units listed as subject to 40 CFR 63 Subpart CC for refinery leaks in Permit V-05-089, reciprocating compressors are exempt from seal requirements if recasting the distance piece or compressor replacement is required.
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- T. Catalyst change-outs with catalyst having properties that fall within the normal range of properties for the given catalyst are considered to be normal operating procedure, and shall not be deemed modifications.
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- U. Pursuant to Regulation 401 KAR 52:020, Section 17(1), a project limited to the installation of fugitive emission components (pumps, valves, flanges, compressors, etc.) shall qualify as an off-permit change if the project is not a modification under Title I of the Clean Air Act, is not subject to the Acid Rain Program, does not violate any existing terms and conditions of this permit, and meets all applicable requirements. If the change qualifies as an insignificant activity as defined in 401 KAR 50:020 Section 6, then the advance notifications described in Section 17(2)(a) – (d) shall not be required.
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- V. The permittee has entered into a consent decree with the US EPA dated August 6, 2001 (*United States of America, et al, v. Marathon Ashland Petroleum, LLC*). Those provisions of the consent decree that are on-going air compliance obligations have been incorporated into this document. For the sake of clarity, completed and discreet obligations have not been included in this draft permit. The affected process units are the FCCU, the SRUs and the leak detection and repair and Benzene Waste NESHAP programs. Where the consent decree obligations are more stringent than either state or federal regulatory obligations, the consent decree obligation demonstrates compliance with the state or federal regulatory obligation.
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### **REFINERY STORAGE TANKS:**

#### **APPLICABLE REGULATIONS**

401 KAR 59:050	New Storage Vessels for Petroleum Liquids
401 KAR 59:174	Stage II Controls at Gasoline Dispensing Facilities (applicable to insignificant gasoline refueling operations)
401 KAR 59:175	New Service Stations (applicable to insignificant gasoline refueling operations)
401 KAR 61:050	Existing Storage Vessels for Petroleum Liquids
401 KAR 60:005 incorporating by reference 40 CFR 60 Subpart A	General Provisions
401 KAR 60:005 incorporating by reference 40 CFR 60 Subpart K	Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After June 11, 1973 and Prior to May 19, 1978
401 KAR 60:005 incorporating by reference 40 CFR 60 Subpart Ka	Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After May 18, 1978 and Prior to July 23, 1984

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**APPLICABLE REGULATIONS**

401 KAR 60:005 incorporating by reference 40 CFR 60 Subpart Kb	Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984
401 KAR 60:005 incorporating by reference 40 CFR 60 Subpart UU	Standards of Performance for Asphalt Processing and Asphalt Roofing Manufacture
401 KAR 57:002 incorporating by reference 40 CFR 61 Subpart Y	National Emission Standard for Benzene Emissions from Benzene Storage Vessels
401 KAR 63:002 incorporating by reference 40 CFR 63 Subpart G	National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry for Process Vents, Storage Vessels, Transfer Operations, and Wastewater
401 KAR 63:002 incorporating by reference 40 CFR 63 Subpart CC	National Emission Standards for Hazardous Air Pollutants from Petroleum Refineries

**REFINERY STORAGE TANKS:**

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<b>Regulatory Clarifications:</b>	
A. <b>HON / Kb</b>	Per 40 CFR 63.110(b)(1), a 40 CFR 63 Subparts F and G (HON) Group 1 or Group 2 storage vessel that is also subject to the provisions of 40 CFR 60 Subpart Kb is required to comply only with the provisions of 40 CFR 63 Subpart G.
B. <b>HON / Y</b>	Per 40 CFR 63.110(b)(2), a 40 CFR 63 Subparts F and G (HON) Group 1 storage vessel that is also subject to the provisions of 40 CFR 61 Subpart Y is required to comply only with the provisions of 40 CFR 63 Subpart G.
C. <b>HON / Y</b>	Per 40 CFR 63.110(b)(3), a 40 CFR 63 Subparts F and G (HON) Group 2 storage vessel that is also subject to the provisions of 40 CFR 61 Subpart Y is required to comply only with the provisions of 40 CFR 61 Subpart Y. The record keeping and reporting requirements of 40 CFR 61 Subpart Y will be accepted as compliance with the record keeping and reporting requirements of 40 CFR 63 Subparts F and G.

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D.	<b>CC / Kb</b>	Per 40 CFR 63.640(n)(1), a 40 CFR 63 Subpart CC Group 1 or Group 2 storage vessel that is part of an existing source and is also subject to the provisions of 40 CFR 60 Subpart Kb is required to comply only with the requirements of 40 CFR 60 Subpart Kb.
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E.	<b>CC / K / Ka</b>	Per 40 CFR 63.640(n)(5), a 40 CFR 63 Subpart CC Group 1 storage vessel that is also subject to the provisions of 40 CFR 60 Subparts K or Ka is required to only comply with the provisions of 40 CFR 63 Subpart CC.
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F.	<b>CC / K / Ka</b>	Per 40 CFR 63.640(n)(6), a 40 CFR 63 Subpart CC Group 2 storage vessel that is subject to the control requirements of 40 CFR 60 Subparts K or Ka is required to only comply with the provisions of 40 CFR 60 Subparts K or Ka.
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G.	<b>CC / K / Ka</b>	Per 40 CFR 63.640(n)(7), a 40 CFR 63 Subpart CC Group 2 storage vessel that is subject to 40 CFR 60 Subparts K or Ka, but not to the control requirements of 40 CFR 60 Subparts K or Ka, is required to comply only with 40 CFR 63 Subpart CC.
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H.	<b>HON / CC</b>	Per 40 CFR 63.640(g)(7), storage vessels subject to the provisions of 40 CFR 63 Subparts F or G are not subject to the provisions of 40 CFR 63 Subpart CC
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I.		The standards and requirements for storage vessels with a storage capacity greater than 580 gallons in 40 CFR 60 Subpart Kb, 40 CFR 63 Subpart G (HON--Group 1 only), and 40 CFR 63 Subpart CC (Refinery MACT--Group 1 only) are more stringent than the standards and requirements in regulations 40 CFR 61 Subpart Y, 401 KAR 59:050, 40 CFR 60 Subpart NSPS K, 40 CFR 60 Subpart Ka, and 401 KAR 61:050. Therefore, compliance with the requirements in either regulation 40 CFR 60 Subpart Kb, 40 CFR 63 Subpart G (HON--Group 1) or 40 CFR 63 Subpart CC (Refinery MACT--Group 1) is accepted as demonstrating compliance with any of these regulations.
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J.	<b>59:050 / K / Ka</b>	Compliance with the requirements of 401 KAR 59:050 new storage tank for petroleum liquid is accepted as demonstrating compliance with 40 CFR 60 Subpart K or Ka, as stated in the permit.
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K.	<b>61:050 / Y</b>	Compliance with 40 CFR 61 Subpart Y is accepted as demonstrating compliance with 401 KAR 61:050, existing storage vessels for petroleum liquid.
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**REFINERY GENERAL WASTE WATER TREATMENT SYSTEM:****APPLICABLE REGULATIONS:**


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401 KAR 59:095	New Oil-Effluent Water Separators
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401 KAR 60:005 incorporating by reference 40 CFR 60 Subpart QQQ	Standards of Performance for VOC Emissions from Petroleum Refinery Wastewater Systems
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401 KAR 61:045

Existing Oil-Effluent Water Separators

401 KAR 63:002 incorporating  
by reference 40 CFR 63 Subpart  
GNational Emission Standards for Organic Hazardous Air  
Pollutants from the Synthetic Organic Chemicals  
Manufacturing Industry**REGULATORY CLARIFICATIONS:**

The standards and requirements for oil-effluent water separators in 40 CFR 60 Subpart QQQ are more stringent than the standards and requirements in 401 KAR 59:095 and 61:045. Therefore, monitoring of oil-effluent water separators per the requirements in 40 CFR 60 Subpart QQQ is deemed compliance with any of these regulations.

**REFINERY BENZENE WASTE WATER TREATMENT SYSTEM:****APPLICABLE REGULATIONS:**

401 KAR 59:095

New Oil-Effluent Water Separators

401 KAR 63:002 incorporating by  
reference 40 CFR 63 Subpart GNational Emission Standards for Organic Hazardous Air  
Pollutants from the Synthetic Organic Chemicals  
Manufacturing Industry401 KAR 63:002 incorporating by  
reference 40 CFR 63 Subpart CCNational Emission Standards for Organic Hazardous Air  
Pollutants from Petroleum Refineries401 KAR 63:002 incorporating by  
reference 40 CFR 63 Subpart DDNational Emission Standards for Organic Hazardous Air  
Pollutants from Off-Site Waste and Recovery Operations401 KAR 67:002 incorporating by  
reference 40 CFR 61 Subpart FFNational Emission Standards for Benzene Waste  
Operations**REGULATORY CLARIFICATIONS:**

- A. The standards and requirements for 40 CFR 63 Subpart CC for wastewater treatment are identical to and reference the standards provided in 40 CFR 61 Subpart FF. Therefore compliance with the standards of 40 CFR 61 Subpart FF is deemed compliance with 40 CFR 63 Subpart CC. The standards and requirements 40 CFR 61 Subpart FF are more stringent than the standards and requirements in 401 KAR 59:095. Therefore, monitoring per the requirements in regulation 40 CFR 61 Subpart FF is deemed compliance with 401 KAR 59:095.

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B. Compliance with 40 CFR 61 Subpart FF is deemed to be compliance with the wastewater provisions of 40 CFR 63 Subpart G.

C. 40 CFR 61 Subpart FF is applicable to the refinery because the Total Annual Benzene (TAB) quantity, representing the amount of benzene in the waste, is greater than 10 Mg/yr. The refinery has selected the benzene waste compliance option provided in 40 CFR 61.342 (e) which allows the following:

Organic waste with less than 10 ppmw benzene does not require control or treatment (40 CFR 61.342(c)(2)); and aqueous waste, containing any level of benzene, unless controlled and treated must be counted towards the facilities Benzene Quantity (BQ) which must not exceed 6 Mg/yr of uncontrolled benzene quantity.(40 CFR 61.342 (e)).

D. There are a large number of waste streams in the refinery, which contain benzene. The refinery must maintain records of these streams and annually report the past year's Total Annual Benzene (TAB) quantity representing all benzene in waste streams and the past year's Benzene Quantity (BQ) representing the total benzene quantity of all aqueous waste streams not handled in a controlled manner in accordance with the specifications of this regulations (40 CFR 61.357).

E. For most waste streams, which require controls, generally those with the highest benzene quantity, the refinery operates a segregated drain system, maintained in accordance with the control and treatment requirements of 40 CFR 61 Subpart FF. This benzene waste system consists of a number of drains routed to junction boxes/lift stations, which are then routed to an above ground pressurized sewer line. This is routed to Tank 890, BRU feed surge tank, and finally to a benzene removal unit. Streams that are managed in this benzene waste water system are considered controlled, and do not need to be counted in the BQ. This system uses individual drain systems, tanks, oil water separators, containers, treatment processes, closed vent systems and control devices. These components of this controlled system must comply with the control requirements of 40 CFR 61 Subpart FF.

### **REFINERY REMEDIATION:**

#### **APPLICABLE REGULATIONS:**

401 KAR 59:095	New Oil-Effluent Water Separators.
401 KAR 60:005 incorporating by reference 40 CFR 60 Subpart Kb	Standards of Performance for Volatile Organic Liquid Storage Vessels.
401 KAR 60:005 incorporating by reference 40 CFR 60 Subpart QQQ.	Standards of Performance for VOC Emissions from Petroleum Refinery Wastewater Systems.

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401 KAR 63:002 incorporating by reference 40 CFR 63 Subpart CC.	National Emission Standards for Organic Hazardous Air Pollutants from Petroleum Refineries.
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401 KAR 67:002 incorporating by reference 40 CFR 61 Subpart FF	National Emission Standards for Benzene Waste Operations.
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**REGULATORY CLARIFICATIONS:****A. Overlap of 40 CFR 63 Subpart CC with 40 CFR 61 Subpart FF**

The standards and requirements of 40 CFR 63 Subpart CC for waste water treatment are identical to and reference the standards provided in 40 CFR 61 Subpart FF. Therefore compliance with the standards of 40 CFR 61 Subpart FF is deemed compliance with 40 CFR 63 Subpart CC.

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**B. Overlap of 40 CFR 63 Subpart CC with 40 CFR 60 Subpart Kb**

40 CFR 63.640(n)(1) specifies that after the compliance dates specified in 63.640(h), a Group 1 or Group 2 storage vessel that is part of an existing source and is also subject to the provisions of 40 CFR part 60, Subpart Kb, is required to comply only with the requirements of 40 CFR part 60, Subpart Kb, except as provided in paragraph (n)(8) of 40 CFR 63.640.

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**C. Overlap of 40 CFR 63 Subpart CC with 40 CFR 60 Subpart QQQ**

40 CFR 63.640(o)(1) specifies that after the compliance dates specified in 63.640(h), a Group 1 wastewater stream managed in a piece of equipment that is also subject to the provisions of 40 CFR part 60, Subpart QQQ, is required to comply only with the requirements of 40 CFR part 63, Subpart CC.

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**D. Overlap of 401 KAR 59:050 with 40 CFR 61 Subpart FF**

The standards and requirements of 40 CFR 61 Subpart FF are more stringent than the standards and requirements in 401 KAR 59:050. Therefore, compliance with the requirements in regulation 40 CFR 61 Subpart FF is deemed compliance with 401 KAR 59:050.

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**E. Overlap of 401 KAR 59:095 with 40 CFR 61 Subpart FF**

The standards and requirements of 40 CFR 61 Subpart FF are more stringent than the standards and requirements in 401 KAR 59:095. Therefore, compliance with the requirements in regulation 40 CFR 61 Subpart FF is deemed compliance with 401 KAR 59:095.

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**EMISSION AND OPERATING CAPS DESCRIPTION:**

The net emissions increase for any regulated New Source Review pollutant shall be less than the significant emissions increase level, as defined in 401 KAR 51:001, for 401 KAR 51:017, Prevention of Significant Deterioration, and 401 KAR 51:052, Review of New Sources, for the installation and



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operation of emission units B024, B025, and B026 [Permit V-05-089 R1]. The increase in potential emissions from the 3 boilers is below the significant emissions level of 40 tons per year for VOC and SO<sub>2</sub>. A netting analysis was performed for NO<sub>x</sub>, CO, and PM<sub>10</sub> emissions.

Pursuant to 40 CFR 63.560(b)(2), in order to preclude the applicability of 40 CFR 63 Subpart Y Sections 63.562 (c) and (d), as referenced by 40 CFR 63 Subpart CC Section 63.651(a), the following loading limits shall not be exceeded at the marine tank vessel loading operations:

<b>Product</b>	<b>Loading Limit (million bbl/year)</b>
Gasoline	10
Crude Oil	200

Emissions due to loading materials at the Viney Branch transfer rack shall not exceed 120.9 tons of VOC during any consecutive 12-month period. [To preclude the applicability of 401 KAR 51:017, PSD, for VOC emissions]

Pursuant to 40 CFR 63.560(a)(2), in order to preclude the applicability of 40 CFR 63 Subpart Y Sections 63.562 (b) and (d), as referenced by 40 CFR 63 Subpart CC Section 63.651(a), the following emission limits shall not be exceeded at the marine tank vessel loading operations. Emissions shall be calculated using the methods specified in 40 CFR 63.565(l).

<b>Pollutant</b>	<b>Any consecutive 12-months period Emission Limit (ton/year)</b>
Each Individual HAP	10
All Combined HAP	25

VDU 1-7-B-1 shall control loading emissions from the New Solvent Truck Loading Rack (L004) with a VOC destruction efficiency of at least 98%. [To preclude the applicability of 401 KAR 51:017, PSD, for VOC emissions]

The use of chromium based water treatment chemicals is prohibited [Requirement to preclude applicability of 40 CFR 63, Subpart Q]

The source has elected to accept permit conditions to preclude the applicability of 401 KAR 51:017, PSD as follows: [Permit VF-02-001 (Revision 3) and revised in V-05-089]

<b>Affected Units</b>	<b>Maximum Emissions (tons/yr)</b>				
	<b>SO<sub>2</sub></b>	<b>NO<sub>x</sub></b>	<b>VOC</b>	<b>CO</b>	<b>PM<sub>10</sub></b>
H001 (1-002-B-003) No. 2 Crude Charge Heater	14.7	54.8	3.0	46.0	4.2

In addition, heat input to the No. 2 Crude Charge Heater shall not exceed 125.0 mmBtu/hr, HHV based on a 365-day rolling average.

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The source has elected to accept permit conditions to preclude the applicability of 401 KAR 51:017, PSD as follows: [Permit S-96-207]

Affected Units	Maximum Emissions (tons/yr)
H014 (1-035-B-003) #1 Cumene Column Reboiler	Nitrogen oxides (NO <sub>x</sub> ) emissions shall not equal or exceed 39 tons/yr

The source has elected to accept permit conditions to preclude the applicability of 401 KAR 51:017, PSD as follows: [Permit VF-02-001 (Revision 3) and revised in V-05-089]

Affected Units	Maximum Emissions (tons/yr)				
	SO <sub>2</sub>	NO <sub>x</sub>	VOC	CO	PM <sub>10</sub>
H019 (2-026-B-002) No. 4 Vacuum Charge Heater	15.1	39.9	3.1	47.1	4.3
H020 (2-023-B-006) No. 4 Vacuum Charge Heater	18.8	97.8	3.8	58.7	5.3

The source has elected to accept permit conditions to preclude the applicability of 401 KAR 51:017, PSD as follows: [Permit VF-02-001 (Revision 3) and revised in V-05-089 R2]

Affected Units	Maximum Emissions (tons/yr)				
	SO <sub>2</sub>	NO <sub>x</sub> (consent limit)	VOC	CO	PM <sub>10</sub>
H021 (2-023-B-003) No. 3 Crude Charge Heater	20.8	54.3 (43.0)	4.65	65.2	5.9
H022 (2-023-B-004) No. 3 Crude Charge Heater	20.8	54.3 (43.0)	4.65	65.2	5.9

In addition, heat input to the No. 3 Crude Charge Heaters shall not exceed 177.1 mmBtu/hr, each, based on a 365-day rolling average.

The source has elected to accept permit conditions to preclude the applicability of 401 KAR 51:017, PSD as follows: [Permit VF-02-001 (Revision 3) and revised in V-05-089 R2]

Affected Units	Maximum Emissions (tons/yr)				
	SO <sub>2</sub>	NO <sub>x</sub> (consent limit)	VOC	CO	PM <sub>10</sub>
H023 (2-030-B-001) Sat Gas Plant Heater	21.0	54.6 (39.0)	4.3	65.6	5.9

In addition, heat input to the Sat Gas Plant Heater shall not exceed 178.2 mmBtu/hr HHV, based on a 365-day rolling average.

The source has elected to accept permit conditions to preclude the applicability of 401 KAR 51:017, PSD as follows: [Permit VF-02-001 (Revision 3)]

Affected Units	Maximum Emissions (tons/yr)				
	SO <sub>2</sub>	NO <sub>x</sub>	VOC	CO	PM <sub>10</sub>
H028 (2-036-B-001) HF Alky Isostripper Reboiler	11.1	41.4	2.3	34.8	3.1

In addition, heat input to the HF Alky Isostripper Reboiler shall not exceed 95 mmBtu/hr. Each of these limits is based on a 365-day rolling average.

The source has elected to accept permit conditions to preclude the applicability of 401 KAR 51:017, PSD as follows: [Permit VF-02-001 (Revision 3)]

Affected Units	Maximum Emissions (tons/yr)				
	SO <sub>2</sub>	NO <sub>x</sub>	VOC	CO	PM <sub>10</sub>
H029 (2-036-B-002) HF Alky Hot Oil Heater	2.3	8.7	0.5	7.3	0.7

In addition, heat input to the HF Alky Hot Oil Heater shall not exceed 20 mmBtu/hr HHV. Each of these limits is based on a 365-day rolling average.

The source has elected to accept permit conditions to preclude the applicability of 401 KAR 51:017, PSD as follows: [Permit VF-02-001 (Revision 3)]

Affected Units	Maximum Emissions (tons/yr)				
	SO <sub>2</sub>	NO <sub>x</sub>	VOC	CO	PM <sub>10</sub>
H034 (2-103-B-001) LPVGO Hydrotreater Charge Heater	5.8	21.7	1.2	18.2	1.6
H035 (2-103-B-002) LPVGO Hydrotreater Charge Heater	5.8	21.7	1.2	18.2	1.6
H036 (2-103-B-003) LPVGO Hydrotreater Stripper Heater	6.5	24.1	1.3	20.2	1.8

In addition, heat input to the LPVGO Hydrotreater Charge Heaters shall not exceed 50 mmBtu/hr HHV, each heater, and heat input to the LPVGO Hydrotreater Stripper Reboiler shall not exceed 55 mmBtu/hr HHV. Each of these limits is based on a 365-day rolling average.

The source has elected to accept permit conditions to preclude the applicability of 401 KAR 51:017, PSD as follows: [Permit VF-02-001 (Revision 3) and revised in V-05-089 R2]

Affected Units	Maximum Emissions (tons/yr)				
	SO <sub>2</sub>	NO <sub>x</sub>	VOC	CO	PM <sub>10</sub>
H037 (2-104-B-001) HPVGO Hydrotreater Charge Heater	11.7	22.0	2.4	36.4	3.3
H038 (2-104-B-002) HPVGO Hydrotreater Charge Heater	11.7	22.0	2.4	36.4	3.3

In addition, heat input to the HPVGO Hydrotreater Charge Heaters shall not exceed 99 mmBtu/hr HHV, each heater, based on a 365-day rolling average.

The source has elected to accept permit conditions to preclude the applicability of 401 KAR 51:017, PSD as follows: [Permit C-91-051 (Revision 3) and Permit VF-02-001 (Revision 3)]

Affected Units	Maximum Emissions (tons/yr)				
	SO <sub>2</sub>	NO <sub>x</sub>	VOC	CO	PM <sub>10</sub>
H043 (2-121-B-001) DDS Reactor Charge Heater	7.1	11.5	1.5	22.3	2.0
H044 (2-121-B-002) DDS Reactor Charge Heater	7.1	11.5	1.5	22.3	2.0
H045 (2-121-B-003) DDS Reactor Stripper Reboiler	11.0	17.8	2.3	34.4	3.1

In addition, heat input to the Distillate Desulfurizer Reactor Charge Heaters shall not exceed 61 mmBtu/hr, each heater, and heat input to the Distillate Desulfurizer Stripper Reboiler shall not exceed 94 mmBtu/hr HHV. Each of these limits is based on a 365-day rolling average.

The source has elected to accept permit conditions to preclude the applicability of 401 KAR 51:017, PSD as follows: [Permit C-92-033 (Revision 2)]

Affected Units	Maximum Emissions (tons/yr)
H046 (1-044-B-001) CCR #2 Charge Heater H047 (1-044-B-002) CCR #2 No. 1 Interheater H048 (1-044-B-003) CCR #2 No. 2 Interheater H049 (1-044-B-004) CCR #2 No. 3 Interheater H050 (1-044-B-005) CCR #2 Reboiler	Total nitrogen oxides (NO <sub>x</sub> ) and sulfur dioxide (SO <sub>x</sub> ) emissions shall not equal or exceed 39 tons/yr

The source has elected to accept permit conditions to preclude the applicability of 401 KAR 51:017, PSD as follows: [Permit V-04-001 and revised in V-05-089 R2]

Affected Units	Maximum Emissions (tons/yr)				
	SO <sub>2</sub>	NO <sub>x</sub>	VOC	CO	PM <sub>10</sub>
H051 (2-122-B-001) KDS Charge Heater	7.65	14.24	1.57	23.91	2.16

The source has elected to accept permit conditions to preclude the applicability of 401 KAR 51:017, PSD as follows: [VF-01-005].

Affected Units	Maximum Emissions (tons/yr)
	NO <sub>x</sub>

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B014 (2-601-B-004) No. 4 Boiler	401
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The source has elected to accept permit conditions to preclude the applicability of 401 KAR 51:017, PSD as follows: [VF-02-001 (Revision 3)]

Affected Units	Maximum emissions (ton/yr)				
	SO <sub>2</sub>	NO <sub>x</sub>	VOC	CO	PM <sub>10</sub>
FCCU (including Heat Recovery Units North and South and Number 5 Package Boiler)	256.0	365.0	55.0	448.0	265.4

In addition, heat input to each of these heat recovery units shall not exceed 431 mmBtu/hr (HHV), based on a 365-day rolling average, and heat input to the Number 5, 13,14, 15 Package Boilers shall not exceed 249.9 mmBtu/hr (HHV), based on a 365-day rolling average.

The source has elected to accept permit conditions to preclude the applicability of 401 KAR 51:017, PSD as follows: [VF-02-001 (Revision 3)]

Affected Units	Maximum emissions (tons/yr)				
	SO <sub>2</sub>	NO <sub>x</sub>	VOC	CO	PM <sub>10</sub>
No. 1 SRU Thermal Oxidizer	323.0	25.0	1.4	21.0	2.0
No. 2 SRU Thermal Oxidizer					

In addition, sulfur production shall not exceed 628 long tons per day, based on a 365-day rolling average. Also, heat input to each thermal oxidizer shall not exceed 28.6 mmBtu/hr (HHV) based on 365-day rolling average. [State-only Requirements from VF-02-001 (Revision 3)]

Emission Unit	Refinery ID
T081	1-6-T-81
T152	1-6-T-152
T701	2-606-T-701
T702	2-606-T-702
T733	2-606-T-733
T734	2-606-T-734
T783	2-606-T-783
T821	2-606-T-821
T845	2-606-T-845
T855	2-606-T-855
Emission Unit	Refinery ID
T856	2-606-T-856
T910	2-606-T-910

T911	2-606-T-911
T912	2-606-T-912
T913	2-606-T-913
T920	2-606-T-920

The source has elected to accept permit conditions to preclude the applicability of 401 KAR 51:017, Prevention of Significant Deterioration as follows: VOC emissions from the above storage vessels shall not exceed 51.9 tons per year, excluding emissions from equipment leaks, and based on a 12-month rolling sum, calculated monthly. [Permit VF-02-001 (Revision 3)]

Pursuant to 40 CFR 63:021 (requirements from permit O-93-016 general condition 20), emissions of the following toxic air pollutants shall not exceed the limits listed below:

Cumene	57.1 lbs/hr	8 hour ave.
Xylene	97.2 lbs/hr	8 hour ave.
Toluene	58.9 lbs/hr	8 hour ave.
1,3 Butadiene	26.1 lbs/hr	8 hour ave.
Trimethylbenzene	156.4 lbs/hr	8 hour ave.
Naphthalene	69.4 lbs/hr	8 hour ave.
Methylene chloride	138.2 lbs/hr	8 hour ave.
Methyl ethyl ketone	720.8 lbs/hr	8 hour ave.
Nonane	306.6 lbs/hr	8 hour ave.
Methanol	37.3 lbs/hr	8 hour ave.
n-Hexane	235.4 lbs/hr	8 hour ave.
Furfural	1.8 lbs/hr	8 hour ave.
Chrysene	0.0059 lb/hr	BACT

**PERIODIC MONITORING:**

Refer to the specific monitoring requirements in section B of permit V-05-089 and general monitoring requirements in the permit section F.

**OPERATIONAL FLEXIBILITY:**

**FCCU Hydrotreater Outage Plan:**

Pursuant to the US EPA Consent Decree, during periods of hydrotreater outage, the permittee can elect to comply with the short-term SO<sub>2</sub> limits or alternatively with actions included in the approved Hydrotreater Outage Plan.

Pursuant to the US EPA Consent Decree, during periods of hydrotreater outage, the permittee can elect to comply with the short-term NO<sub>x</sub> limits or alternatively with actions included in the approved Hydrotreater Outage Plan.

**SRU Sulfur Shedding Plan:**

Sulfur shedding plan will be followed as necessary when both SRU#1 and SRU#2 are inoperable. The plan shall be undertaken in the sequence necessary to achieve compliance as expeditiously as

**CREDIBLE EVIDENCE:**

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has only adopted the provisions of 40CFR Part 60, SEC. 60.11 and 40 CFR Part 61, SEC. 61.12 into its air quality regulations.